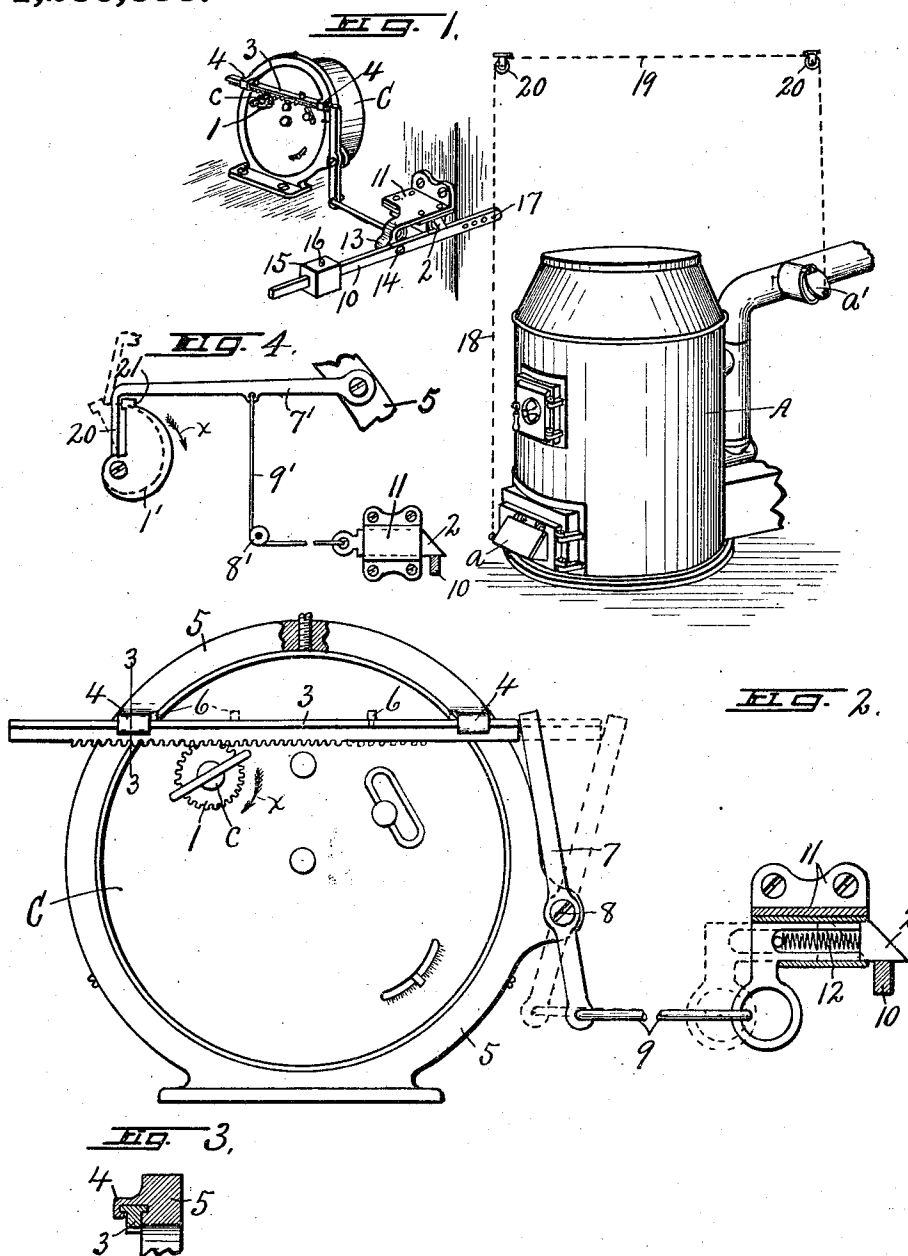


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DRAFT CONTROLLED DETENT.
APPLICATION FILED NOV. 16, 1914.

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DRAFT-CONTROLLED DETENT.

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To all whom it may concern:

Be it known that we, JOHN J. WENDEL and HARRY W. BALSLEY, citizens of the United States, and residents of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Draft-Controlled Detents, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in draft controlled detents as applied more particularly to the automatic regulation of draft and check dampers of heaters and to the operation of electric switches and other time controlled apparatus.

The main object is to provide simple and comparatively inexpensive means adapted to be set by the operator to automatically trip the detent at any time within a period of twelve hours from the time of setting for opening a draft damper, closing a check damper, or simultaneously opening one damper and closing the other, or for operating an electric switch to open or close an electric lighting or other circuit at a predetermined time.

In other words, we have sought to provide chronometer controlled means for causing the draft of a heater to be opened at any predetermined time, as for example, in the morning after the device has been set the night before, or it may be used to automatically turn out the lights of an electric circuit at any predetermined time, as for example, at mid-night or at the dawn of day, without further attention from the operator after being set any time during the previous twelve hours.

Other objects and uses relating to specific parts of the device will be brought out in the following description.

In the drawings—

Figure 1 is a perspective view of a heater showing a draft damper and check damper and one form of our improved controlling device therefor.

Fig. 2 is an enlarged elevation partly in section and partly broken away of the same damper controlling device shown in Fig. 1.

Fig. 3 is an enlarged detail sectional view taken on line 3—3, Fig. 2.

Fig. 4 is an elevation of a modified form of clock actuated means for tripping the detent.

This device may be applied to any form of heat controller, such as, for example; the

draft and check dampers —*a*— and —*a'*— of a hot-air, steam, or hot water heater —*A*—, or an electric switch —*b*— of a lighting or heat circuit —*B*—, and preferably comprises a clock driven actuator —1—, a detent —2— and suitable means for transmitting motion from the actuator to the detent for tripping the latter at a predetermined time.

As shown in Figs. 1 and 2, the actuator —1— consists of a gear or pinion secured to the rear end of an alarm operating spindle —*c*— of an ordinary alarm clock —*C*—, and meshing with a sliding toothed rack —3— which is guided in suitable ways —4— on the back of a clock supporting frame —5—, so that when the alarm spindle —*c*— is set in the usual manner to be released at a predetermined time, the toothed rack —3— will be shifted or set to its normal supporting position, and upon the automatic release of the alarm spindle —*c*— in the manner well known for alarm clocks, the pinion or actuator —1— will be rotated in the direction indicated by the arrow —*X*—, Fig. 2 to shift the bar —3— to the position shown by dotted lines Fig. 2, the bar being limited in its forward and backward movement by stops —6— thereon engaging with the inner faces of the guide-ways —4—.

A lever —7—, of the first kind, is fulcrumed at —8— upon the clock-supporting frame —5— with its upper end in engagement with the front end of the toothed rack —3— and its lower end connected by a link —9— to the detent —2—, so that when the spindle —*c*— is released at a predetermined time to which it has been previously set, the bar —3— will be driven forwardly by the rotation of the pinion —1—, thereby operating the lever —7— and link —9— to withdraw the detent from holding engagement with the damper operating lever —10—.

This detent —2— preferably consists of a sliding bolt guided in a suitable frame —11— and normally spring-pressed to its holding position by a coil spring —12—, but is adapted to be withdrawn from such position, or tripped, by the operation of the lever —7— from its normal position to the position shown by dotted lines in Fig. 2. The lever —10— is fulcrumed intermediate its ends at —14— upon an extension —13— of the detent supporting frame —11— and is provided at one end with an adjustable weight —15— held in place by set screw —16—, the opposite end being provided

with a series of apertures —17— for permitting the attachment of suitable damper operating cables —18— and —19—, the cable —18— being directly connected to the draft door —a—, while the cable —19— is passed around suitable sheaves —20— and connected to the check damper —a'—.

The damper operating lever —10— is set by hand to bring the end thereof which is connected to the cables —18— and —19— directly under the detent —2—, the latter serving to hold the lever —10— in this position against the action of the weight —15— until the detent is tripped or withdrawn from its holding position at a predetermined time at which the clock is set to release the alarm operating spindle —c—.

Instead of employing the pinion —1— and rack —3— as the means for controlling the operation of the detent, we may substitute for the pinion a cam actuator —1'— which is secured to the alarm spindles —c— and coöperates with a suitable lever —7'— to trip the detent through the medium of a cable —9'—, having one end connected to said lever and its other end passed around a sheave —8'— and connected to the detent —2—.

The lever —7'— is preferably provided with a downwardly offset end —20— resting upon the perimeter of the cam —1'—, which is of sufficient throw that when released and rotated by the clock mechanism in the direction indicated by the arrow —X—, will elevate the free end of the lever —7'—, and thereby draw the cable —9'— in the same direction to withdraw the detent —2— from holding engagement with the damper operating lever —10—, which will then be actuated by its weight —15— to open the draft damper —a— and close the check damper —a'—, the highest point of the cam being provided with a shoulder —21— adapted to engage the lower end of the offset portion —20— of the lever —7'— to limit the degree of rotation of the actuator —1'— after the draft damper has been opened and the check damper closed.

This draft controlling device is preferably located near the furnace, so that the attendant, after fixing the furnace for the night with the draft damper closed and the check damper open, may set the device to maintain the dampers in this position until a predetermined time in the morning, at which time the detent —2— will be tripped to release the lever —10— and allow the weight —15— to operate the same for opening the draft door and closing the check damper, it being understood that the draft door closes by its own gravity when the cable —19— is slackened by the upward movement of the end of the lever —10— to which it is attached;

for example, assuming that an ordinary alarm clock is provided with the usual alarm spindle —c— to which the pinion —1— has been secured and that the attendant, after fixing the furnace for the night, wishes to have the draft opened at —5— o'clock the next morning. It is then simply necessary to set the usual alarm index finger to the hour graduation —5— on its corresponding dial and to then wind the alarm spindle in the direction opposite that indicated by the arrow —X—, which, of course, will withdraw the bar —3— and allow the spring —12— of the detent —2— to return the link —9— and lever —7— to the position shown by full lines in Fig. 2, and at the same time, forcing the detent to its holding position, whereupon the damper operating lever —10— is adjusted by hand into holding engagement with said detent against the action of the weight —15—.

Now, as the clock continues to act in the usual manner, the spindle —c— and pinion —1— thereon will be released at exactly 5 o'clock in the morning to operate the bar —3— and lever —7— for the purpose of withdrawing the detent —2— and releasing the damper operating lever —10—, which in turn is operated by the weight —15— to open the draft damper —a— and close the check damper —a'— through the medium of their respective cables —18— and —19—, this operation of setting the device and its automatic release of the detent for the damper operating mechanism being repeated each night.

What we claim is:

A draft controlled detent including the combination with an alarm clock having a rotatable winding stem for the alarm mechanism, of a gear secured on said winding stem, a pair of aligned spaced lugs formed upon the rear of said clock and provided with grooves, said lugs being located above and in spaced relation to said gear, a rack bar longitudinally slidable in the grooves of said lugs and in constant mesh with said gear, said lugs and gear preventing the bar from having any vertical movement with relation to said clock and a lever pivoted intermediate its ends to the periphery of said clock and having one end located in the path of movement of one end of said rack bar and its free end being connected to a device to be operated.

In witness whereof we have hereunto set our hands this 10th day of November 1914.

JOHN J. WENDEL.
HARRY W. BALSLEY.

Witnesses:

H. E. CHASE,
ALICE M. CANNON.